The Impact of Market and Organizational Characteristics on Nursing Care Facility Service Innovation: A Resource Dependency Perspective

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Objective. Using resource dependency theory as a conceptual framework, this study investigates both the organizational and environmental factors associated with an emerging health care service delivery innovation, the provision of specialty care in designated units in nursing care facilities. We consider two types of specialty units, Alzheimer's Disease and subacute care.

Data Sources. The Medicare/Medicaid Automated Certification Survey (MMACS) data file was merged with local market area data obtained from the 1992 Area Resource File and with state level regulatory data.

Study Design. The likelihood of providing Alzheimer's Disease or subacute care in dedicated units was estimated by separate logistic regressions.

Principal Findings. Results indicate that facilities with fewer Medicare patients are more likely to operate a dedicated Alzheimer's care unit, while facilities located in markets with a large HMO population and greater hospital supply are more likely to operate a subacute care unit. While competition among nursing homes, for the most part, is an incentive to innovate, greater regulatory stringency appears to constrain the development of specialty care units of both types. Finally, organizational characteristics (e.g., size and proprietary status) appear to be important enabling factors influencing the propensity to provide specialty care in dedicated units.

Conclusions. Nursing care facilities are moving toward providing specialty care units partly as a response to a growing demand by resource providers and to maintain a competitive edge in tighter markets. Loosening regulation directed at cost containment would further encourage the development of specialty care but should be preceded by some evaluation of population needs for specialty care and the effectiveness of specialty care units.

Key Words. Nursing care facilities, service innovation, resource dependency, competition

The emergence of dedicated units providing specialized care ranging from rehabilitation to hospice is a service innovation that has expanded the scope of services provided in nursing care facilities (Taravella 1992; Wagner 1988; Greene 1986; LaRiccia 1988; Ohta and Ohta 1988). The Health Care Financing Administration (HCFA) defines dedicated special care units as units with a specific number of beds identified and dedicated by the facility for residents with specific needs or diagnoses (Health Care Financing Administration 1992). For example, a skilled nursing care facility admitting a large number of residents with head injuries for which they have set aside eight beds staffed with specifically trained personnel is likely to be identified as having an eight-bed head trauma unit. Because in most states these units are not defined for purposes of reimbursement or licensure, they tend to be highly heterogeneous in terms of philosophy, environmental design, and therapeutic approach (Ohta and Ohta 1988; Gold, Sloane, Mathew, et al. 1991).

Service innovation in health care is frequently motivated by changes in technology or new market opportunities (Kaluzny and Hernandez 1988). The origin of dedicated specialty care units can be traced to recent developments in the areas of policy, regulation, and technology that changed expectations of the role of nursing care facilities in the health care delivery system. For example, attention was called to the specialized needs of Alzheimer's and other dementia patients by organized constituencies in the early 1980s (Gwyther 1985). In response, Alzheimer's units were adopted to better manage the care of a subset of existing nursing home residents with behavioral problems. The majority (approximately 65 percent) of specialty care units in 1992 were dedicated to the care of patients with Alzheimer's disease (Zinn and Mor 1994). However, dedicated units providing subacute care have also emerged in response to the need for postdischarge treatment alternatives. Changes in technology and treatment paradigms for certain medical conditions have also increased the demand for subacute care. The availability of life-extending drugs transforming AIDS from an acute to a chronic disease, and the increased survival of head trauma patients, have created a need for appropriate post-hospitalization discharge alternatives. Almost 10 percent of

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Medicare- or Medicaid-certified facilities were providing at least one of eight types of specialty care in dedicated units in 1992 (Zinn and Mor 1994).

Following a developmental path similar to that of hospitals in the early decades of the twentieth century (Starr 1982), nursing care facilities may be evolving toward greater specialization. If specialization is the future direction in which nursing facility care is going, dedicated units may become commonplace relatively soon. However, very little is known about the characteristics of facilities that provide specialty care. In addition, while there is evidence that the distribution of specialty care beds exhibits substantial interstate and interregional variation (Zinn and Mor 1994), the characteristics of markets in which these units are most likely to be located has not been investigated. The purpose of this study is to investigate both the organizational and environmental factors associated with providing specialty care in dedicated units in nursing care facilities.

THEORY AND HYPOTHESES

Many perspectives on organizational innovation assume an environmental motivation (Ulrich and Barney 1984). Resource dependency theory conceptualizes the environment in terms of other organizations with which the focal organization engages in exchange relationships (Thompson 1967; Pfeffer and Salancik 1978). Most organizations depend on the resources traded in these exchanges for survival, and they will make the necessary accommodations to guarantee exchange relationships with other organizations. Thus, changes in organizational structure or behavior may reflect accommodations intended to secure a stable flow of resources from the environment (Oliver 1990). All things being equal, as dependency on key resource providers increases, so does organizational accommodation. Differences in operating environment and in organizational characteristics will mediate the need and the ability to respond to key constituents.

DEPENDENCY RELATIONSHIPS

While an organization will accommodate the demands of many interest groups, the organization's likelihood of response to any given demand will increase with the importance of the resource provided and the interest group's level of control over that resource. If few alternative sources for a resource exist, compliance becomes more likely.

Because subacute care and Alzheimer's care units respond to the needs of different resource providers, they form different dependency relationships. For example, among the critical resources needed by nursing care facilities are patient referrals. Alzheimer's care is a response to the needs of the private pay market and admissions are more likely to come from the community. On the other hand, subacute care is responsive to the needs of hospitals, particularly with respect to Medicare discharges.

The recent growth in managed care has stimulated efforts to maximize cost-effectiveness in hospitals, and consequently has increased their incentive to promote the use of alternatives to inpatient care, like subacute care. The acute care sector has been faced with greater pressure than the long-term care sector to develop postdischarge options for individuals seriously in need of skilled nursing care, and hospitals have begun to play an important role in developing a continuum of services across care settings. Consequently, hospitals may play an important role in pressuring nursing homes to develop more subacute options, and particularly in markets with excess hospital capacity where competition among hospitals for managed care contracts may be intense, nursing care facilities may feel pressured to offer subacute care in response to hospital demand.

Hypothesis 1. Facilities in areas with more hospitals relative to the supply of nursing homes will be more likely to develop units specializing in the provision of subacute care.

In addition, managed care plans looking for less costly alternatives to hospitals for beneficiaries with specific conditions, such as AIDS or brain injuries, now contract directly with subacute care providers (LaRiccia 1988; Mason 1992; Pallarito 1992). This new market opportunity may encourage the development of these units in nursing care facilities.

Hypothesis 2. Facilities in areas with greater HMO penetration will be more likely to develop units specializing in the provision of subacute care.

Nursing home residents whose care is reimbursed by Medicare are more likely to be recovering from acute illness, trauma, or surgery, requiring a greater intensity of service than chronic long-term care patients need (Shaugnessy and Kramer 1989). Facilities seeking Medicare certification and accepting Medicare patients indicate a willingness to provide a broad range of specialized services that for some patients could include subacute care.

Facilities that make a commitment to provide subacute care to Medicare recipients may decide to group them together in a separate unit to obtain volume-related efficiencies and to promote the development of higher levels of expertise in staff assigned to the unit (Mason 1992; LaRiccia 1988). Facilities with a small proportion of Medicare residents are dealing with two products representing two different technologies–traditional custodial care and subacute care. On the other hand, nursing care facilities accepting larger numbers of Medicare recipients increase overall case-mix acuity and must develop specialized staff and resources on a facility-wide basis that fundamentally differ from the "core technology" of long-term care. In this case, the efficiency gained from designating a special unit for subacute care will not be greater than the costs of developing such a unit. Consequently, we predict a nonlinear relationship between the proportion of residents who are Medicare recipients and the development of subacute care units.

Hypothesis 3. Facilities accepting Medicare recipients will develop a broad range of diversified services that includes the provision of subacute care in dedicated units. However, facilities with a high proportion of Medicare recipients will be more likely to provide subacute care on a facility-wide basis and less likely to develop dedicated units.

As a result of regulatory changes, referral relationships between nursing care facilities and hospitals have undergone substantial change. There is evidence that the implementation of Medicare's prospective payment system (PPS) for hospitals, which created incentives to shorten hospital stays and increased demand for postdischarge treatment alternatives, led to increases in the proportion of nursing care facility residents requiring subacute care, such as ventilators or IV therapy (Shaugnessy and Kramer 1989; Neu and Harrison 1988; Lyles 1986). In addition, mortality in nursing care facilities rose concurrent with a decline in mortality in hospitals after PPS implementation, suggesting that more critically ill patients became more likely to be transferred to nursing facilities just before they died (Sager, Leventhal, and Easterling 1987). Nursing facilities dependent on hospitals for postdischarge referrals may develop subacute care facilities to accommodate their needs.

Hypothesis 4. Facilities located in areas with a higher proportion of Medicare hospital discharges will be more likely to develop units specializing in the provision of sub-acute care.

ENVIRONMENTAL FACTORS

According to theory, dependency on external constituencies is not in itself problematic if resources are stable and sufficient. However, environments vary with respect to munificence (the abundance of resources) and uncertainty (the variability and complexity involved in acquiring resources). The decision to comply with the needs or demands of other organizations will depend on how abundant and stable resources are in a given market environment. Under favorable market conditions, the organization may not feel constrained to comply with the demands of external constituencies. Under less favorable conditions, the organization may have no choice.

While dependency relationships differ by unit type, environmental factors affect the ability to provide any type of specialty care in a dedicated unit. The degree of competition in the local market will be one environmental factor mitigating compliance with external constituencies. In more competitive environments, organizations share a limited resource pool (Pfeffer and Salancik 1978) and survival depends more (than in less competitive environments) on how resources are allocated across competitors. Responsiveness to the needs of key constituents becomes critical to competitive viability.

Hypothesis 5. Facilities located in more competitive markets will be more likely to develop special care units of both types.

State regulatory policies also have a major impact on the ability of the organization to secure resources from the environment (Cook et al. 1983), in part by discouraging innovative change among competitors (DiMaggio and Powell 1983; Meyer and Rowan 1977). While differing in stringency and scope, most state policies aimed at controlling Medicaid costs have focused primarily on containing the supply of nursing facility beds. Restrictions on new bed construction under certificate of need (CON) and new construction moratoria have limited the growth of additional capacity in many states. Nursing care facilities constrained from making capital expenditures may be less able to develop specialty care units than they would be without such constraints. In addition, CON legislation may be a barrier to new market entry, reducing competition for incumbents. Lack of competition removes an important incentive to innovate.

Hypothesis 6. Facilities located in states with active CON programs or moratoria on new construction will be less likely to develop units dedicated to the provision of special care.

State Medicaid reimbursement policies constitute another factor that may influence the ability of nursing care facilities to secure resources from the environment. In markets in which Medicaid is a major presence, reimbursement that does not cover the actual costs of care may discourage innovation.

Hypothesis 7. In markets with higher Medicaid reimbursement rates, facilities with higher Medicaid census will be more likely to develop units dedicated to the provision of special care.

The wide variability in Medicaid payment levels across states may reflect differences in payment methodologies as well as budget constraints (Swan, Harrington, and Grant 1988). Within fairly broad parameters, states have flexibility in establishing payment methodologies for nursing facility care (Buchanan, Madel, and Persons 1991). While subject to cost ceilings in some states, facilities operating under retrospective reimbursement are reimbursed for actual costs incurred. In prospective payment schemes, rates are set in advance of actual experienced costs, and may be based on the facility's previous year costs. Alternatively, prospective payment may be class-based, which is effectively a flat rate for all facilities within a certain class within the state. Compared to retrospective cost plus–based reimbursement, payment of a flat rate makes it more difficult for facilities to anticipate coverage for the costs of care. Depending on the relationship to actual facility cost, facility-based prospective reimbursement methods range between these two in stringency (Cohen and Dubay 1990).

Hypothesis 8. In markets with more stringent forms of Medicaid reimbursement, facilities with a higher Medicaid census will be less likely to develop units dedicated to the provision of special care.

ORGANIZATIONAL CHARACTERISTICS

Organizations may exercise some degree of strategic choice in their efforts to position themselves favorably within the environment. For example, by providing specialty care in a dedicated unit, the nursing home engages in related diversification, a corporate level growth strategy entailing entry into a new product or service market and requiring an appreciable increase in managerial competence (Porter 1980, 1981). Diversification is considered related when the firm is able to transfer core idiosyncratic skills in technology or marketing to the new product or service. Because specialty care differs in

service requirements, cost structure, and financing mechanisms from traditional nursing facility care, entry into this market qualifies as diversification. However, to the extent that the facility is able to integrate existing ancillary services, such as physical and occupational therapy, it can be considered related diversification.

Firms diversify in response to changing environmental threats and opportunities that signal the need to employ existing resources more profitably. Diversification reduces exposure to risk by stabilizing cash flows in the primary line of business. From a resource dependency perspective, diversification achieves a better balance of power in the operating environment. As with environmental factors, organizational characteristics affect the ability of facilities to develop specialty care units of any type. Organizational capabilities may be important enabling factors in strategic choice, because the organization's existing capacities for attaining resources will constrain strategic options. Larger facilities command greater internal resources, including larger administrative staffs focused on strategic needs, and may be more capable of accommodating environmental demands through internal restructuring than smaller facilities would be. Similarly, system membership will signify greater resource availability, particularly access to capital for diversification, providing flexibility in responding to the needs of a changing environment.

Hypothesis 9. Larger nursing homes, and those belonging to systems, will be more likely to develop units dedicated to the provision of special care.

Differences in mission may also influence the decision to provide specialty care. For-profit facilities presumably are the most market-oriented providers and will have incentive to introduce new services that attract more or new consumers. However, for-profits will also lack access to the unrestricted revenues necessary for start-up of these units; subsidized non-profits and system-owned for-profits may have greater access to "deep pockets." Experience from the hospital sector suggests that while the provision of subacute care may meet other organizational objectives, the units are unlikely to be net profit contributors (Burns 1994). In addition, among non-profits, missions reflect a commitment to serve a specific, identifiable constituency, and non-profits will invest in innovations regardless of the ability to recoup their investment.

Hypothesis 10. Non-profit facilities will be more likely to develop units dedicated to the provision of special care.

Finally, these analyses control for the proportion of private pay residents within nursing care facilities. In the absence of mandated rate equalization, private pay rates are usually higher than Medicaid rates and are a more valued source of revenue (Wagner 1988). Provision of specialty care in dedicated units may appeal to the private pay sector by dispelling the negative image of nursing home care. Alternatively, homes may be able to afford the investment in dedicated Alzheimer's units only if they have an existing mix of residents that includes a large number of private pay residents. Because the relationship between the proportion of private pay residents in a facility and the provision of specialty care units may be explained by a number of factors, not all of which are relevant to the main propositions of this article, we do not discuss this control variable in depth.

METHODS

Source of Data. The Medicare/Medicaid Automated Certification Survey (MMACS) compiles data routinely gathered by state licensure and certification agencies responsible for enforcing compliance with Medicare and Medicaid regulations. Data items in surveys conducted after April 1, 1991 include resident case mix; the number and type of regulatory deficiencies; type of ownership, hospital affiliation, or whether the facility is part of a larger, multifacility organization; and the presence of dedicated special care units, staffing, and professional and ancillary services. The survey data file we used contains this information for 16,105 unduplicated Medicare- or Medicaid-certified facilities. Not included are facilities providing intermediate care for the mentally retarded and facilities that did not seek accreditation or reaccreditation as Medicare or Medicaid providers during the period June 1991 through October 1992. In addition, we dropped all hospital-based facilities from the analyses because they usually have fundamentally different organizational structures and strategic aims.

Data on nine categories of special care are included in the survey: AIDS, dialysis, head trauma, Huntington's disease, Alzheimer's disease, disabled children, hospice, ventilator care, and other specialized rehabilitation. Because the MMACS survey items related to special care units are not edited for accuracy by state regulators or HCFA staff prior to computer entry, we first screened the data for errors. Eight of the nine categories of special care units indicated in the survey are included in this study. Ventilator care was excluded because of apparent errors in data entry (very few facilities reported

having a unit and, of those that did, some reported more ventilator beds than total beds).

The MMACS data file was then merged with local market area data obtained from the 1992 Area Resource File (Stambler 1988). Among the regulatory structure differences included for the state were whether the state had a CON or construction moratoria, the average Medicaid nursing home reimbursement rate, whether the state used a prospective class payment rate, and whether the state had case-mix adjustment (Harrington, DuNah, and Curtis 1994; Swan, Harrington, Grant, et al. 1993).

The county, used to represent the market for health care services in a number of studies (Nyman 1985, 1987, 1989; Joskow 1980; Farley 1988; White and Chirikos 1988), approximates the market for nursing care facility services in this analysis. Patterns of funding and patient origin suggest that the county may reasonably approximate the long-term care market. For example, federal block grant funds for long-term care services are distributed at the county level. In addition, Gertler (1989) found that 75 percent of patients residing in New York state nursing facilities had previously lived in the same county.

Model Specification and Operationalization. The following model of the relationship between the likelihood of providing specialty care in a dedicated unit and organizational and market characteristics was separately specified for Alzheimer's and subacute care:

$$p(\textit{specialty care unit} = 1) = f(\textit{environmental variables, organizational variables, and control variables})$$

Table 1 describes the variables used to operationalize the model and their sources. The dependent variable is dichotomous, taking the value 1 if the facility has a dedicated unit for Alzheimer's or subacute care, 0 otherwise. The dependent variable for subacute care was constructed by combining all types of specialty care units other than Alzheimer's care. Since the dependent variable is binary, the logistic procedure was used to fit the regression model (SAS 6.03). While comparable to ordinary least squares regression, the coefficients in a logistic regression model are interpreted as the logarithm of the odds of an event occurring given the independent variables specified in the equation. The independent variables included in the model correspond to the hypotheses derived from the predictions of resource dependency theory.

Dependency relationships were measured by county level estimates of the number of hospitals relative to the number of nursing homes (Hypothesis 1), the proportion of county residents who were HMO members

Table 1: Definitions and Sources of Variables

Variable	*Definition*	*Source*
Dependent Variables		
Has Alzheimer's/ dementia unit	Whether home has a specialty care unit for Alzheimer's or dementia	MMACS
Has subacute care unit	Whether home has a speciality care unit for AIDS, dialysis, disabled children, head trauma, hospice, Huntington's, or special rehabilitation	MMACS
Dependent Relationships		
Number Hospitals/ Number nursing homes	Number of hospitals in county relative to number of nursing homes (1990)	ARF & MMACS
HMO membership	Proportion of county residents who are HMO members (1990)	ARF
Proportion Medicare	Proportion of residents in home with Medicare coverage	MMACS
Medicare hospital discharges	Number of hospital discharges that have Medicare coverage relative to the number of nursing home beds in county (1990)	ARF & MMACS
Competition Measures		
Herfindahl index	Index of nursing home market share concentration of beds	MMACS
Excess SNF capacity	Average number of empty beds per facility in county	MMACS
Hospital-based inpatient services	Number of hospital units in county providing Alzheimer's, hospice, SNF, or respite care	ARF
Hospital-based outpatient services	Number of hospital units in county providing adult day care, home health, geriatric psychiatric, or senior membership programs	ARF
State Policy		
CON/Moratoria	Equals 1 if state has either a CON law or a moratorium on new construction in 1990	Harrington et al. 1994
Medicaid per diem	State average Medicaid per diem payment for ICFs (1989)	Swan et al. 1993
Prospective payment	Equals 1 if state has a prospective class payment system for ICFs (1989)	Swan et al. 1993
Case-mix adjustment	Equals 1 if state uses case-mix adjustments in 1989	Swan et al. 1993

continued

Table 1: Continued

Variable	*Definition*	*Source*
Other facility characteristics		
Facility size	Number of beds in SNF	MMACS
Chain affiliation	Whether nursing home is owned by a chain organization	MMACS
Proprietary status	Whether nursing home under for-profit ownership	MMACS
Municipal-owned	Whether nursing home is owned by county or local government	MMACS
Proportion private pay	Proportion of self-paying residents in nursing home	MMACS
Demand Characteristics		
Unemployment rate	Proportion of civilian labor force that is unemployed (1990)	ARF

(Hypothesis 2), the number of Medicare hospital discharges (Hypothesis 4), and by facility level estimates of the proportion of residents covered by Medicare (Hypothesis 3).

Competition among facilities (Hypothesis 5) was measured by the degree of concentration in the local market, excess capacity, and the availability of substitutes for nursing facility care. Market share concentration was represented by a Herfindahl index based on bed capacity. This index is constructed by combining the squared market shares of all facilities in the county. Market share is defined as each facility's percentage share of total beds in the county. The index ranges from 0 to 1 with higher values signifying greater concentration. Thus, a Herfindahl of 1.0 would indicate a market with only one provider. Excess capacity was measured by the average number of unoccupied beds in a given market (Nyman 1987). In areas with greater excess capacity, competition among facilities may increase (Scanlon 1980; Nyman 1987). The availability of hospital-based substitutes for nursing home specialty care was measured by both the number of inpatient hospital–based SNFs and specialty care units, and the number of outpatient ambulatory geriatric care services. The availability of hospital-based substitutes, by diverting demand and potential referrals, should increase competition among nursing home facilities.

Regulatory characteristics were measured at the state level and included the presence or absence of a strong regulatory structure, as indicated by

the existence of a CON law or a new construction moratoria (Hypothesis 6), the average Medicaid per diem (Hypothesis 7), and the stringency of reimbursement mechanisms, as indicated by the existence of a prospective class payment system and of case-mix adjustments in Medicaid payments (Hypothesis 8). States with prospective class payment systems are expected to have fewer specialty care units because this type of reimbursement does not cover expenses related to the specialty care needs of patients within a specific facility. An interaction term was included to determine if the impact of prospective class payment increases with Medicaid census at the facility level. On the other hand, case-mix adjustments can increase the likelihood that facilities will be reimbursed if they accept more patients with specific needs. However, whether case-mix adjustment encourages the development of specialty care units or increases case-mix acuity for the facility as a whole is not predetermined. Finally, enabling organizational characteristics are measured by size (Hypothesis 9), system membership (Hypothesis 9), and control status (Hypothesis 10).

In addition, variables were included in the model as controls for the proportion of private pay within facilities and, for consumer demand of specialty care, at the market level. The unemployment rate was included to control for differences in economic conditions across markets, with the expectation that lower unemployment rates would signify better economic conditions and, consequently, a greater demand for specialized care.

RESULTS

Descriptive statistics for all variables included in the model are presented in Table 2. The results of the logistic regression estimations for subacute and Alzheimer's disease care–dedicated units are presented in Table 3. A chi-square test of the joint significance of the independent variables (based on -2 times the log likelihood function) for the likelihood of providing subacute care in a dedicated unit equaled 259.34, which was statistically significant at $p = .0001$. The logistic model correctly predicted 68 percent of the cases. For the Alzheimer's care unit estimation, the chi-square value was 534.11, which was statistically significant at $p = .0001$. The logistic model correctly predicted 70 percent of the cases.

These results supported a resource dependency model as outlined in our hypotheses. The number of hospitals relative to the number of nursing facilities in the county (Hypotheses 1) is associated with an increased likelihood that nursing facilities will provide subacute care in a dedicated unit.

Table 2: Descriptive Statistics

Variable	*Mean*	*s.d.*
Dependent Variable		
Has Alzheimer's/dementia unit	.065	.246
Has subacute care unit	.035	.184
Dependent Relationships		
Number Hospitals/Number nursing homes	.361	.262
HMO membership	.106	.198
Proportion Medicare	.048	.114
Medicare hospital discharges	6.256	4.147
Competition Measures		
Herfindahl index	.209	.242
Excess SNF capacity	.123	.084
Hospital-based inpatient services	6.67	13.44
Hospital-based outpatient services	9.52	19.17
State Policy		
CON/Moratorium	.852	.355
Medicaid per diem	49.00	10.67
Prospective payment	.232	.422
Case-mix adjustment	.366	.482
Other facility characteristics		
Facility size (in beds)	110.47	66.23
Chain affiliation	.492	.500
Proprietary status	.734	.442
Municipal-owned	.047	.211
Proportion private pay	.288	.219
Demand Characteristics		
Unemployment rate	57.29	20.42

This suggests that competition among hospitals, because it affects the supply of patients to nursing facilities or because it increases the demands for post-acute care settings, influences the behavior of nursing facilities. At the facility level, the results indicate a curvilinear relationship between the proportion of residents covered by Medicare and the likelihood of a facility providing subacute care in a dedicated unit. The combined effects of the proportion of Medicare residents and the squared value of that variable suggests that having Medicare certification and only a small number of Medicare residents increases the likelihood of having a subacute care unit but that, as the proportion of Medicare residents increases, the likelihood of having a unit falls.

All other predicted dependency relationships, with one exception, are statistically significant. Facilities located in markets with larger HMO

Table 3: Maximum Likelihood Estimates of a Logistic Model of Whether Homes Provide Specialty Care in Alzheimer's and Subacute Units

	Alzheimer's Units		*Subacute Units*	
Variable	*B*	*(s.e.)*	*B*	*(s.e.)*
Intercept	−2.904***	0.298	−3.050***	0.445
Dependent Variables				
Number hospitals/Number nursing homes	0.232	0.190	0.646**	0.301
HMO membership	0.027	0.188	0.784***	0.209
Proportion Medicare	0.928	0.726	3.660***	0.783
Proportion Medicare-squared	−2.219***	0.872	−4.032***	0.867
Medicare hospital discharges	−0.024**	0.011	−0.035**	0.016
Competition Variables				
Herfindahl index	−0.528**	0.232	−2.321***	0.439
Excess SNF capacity	2.205***	0.425	1.204*	0.688
Hospital-based inpatient services	0.010	0.012	−0.009	0.014
Hospital-based outpatient services	−0.006	0.008	0.011	0.010
Regulatory Variables				
Has CON/moratorium	−0.314**	0.124	−0.198	0.181
Medicaid per diem	0.002	0.004	0.009	0.005
Has prospective payment	−0.504**	0.232	0.256	0.272
Prospective system × proportion Medicaid (in home)	0.049	0.324	−0.812**	0.362
Has case-mix adjustment	−0.136*	0.078	−0.247**	0.108
Facility Variables				
Facility size (in beds)	0.006***	0.000	0.002***	0.001
Chain affiliation	0.388***	0.073	0.135	0.095
Proprietary status	−0.405***	0.079	−0.243**	0.107
Municipal-owned	−0.115	0.159	0.092	0.214
Proportion private pay	0.922***	0.167	−0.801***	0.240
Demand Variables				
Unemployment rate	−0.009***	0.002	−0.007	0.003

Note: Statistical significance, Wald χ^2: *$p < .10$, **$p < .05$, ***$p < .001$.

memberships are more likely to provide subacute care. On the other hand, it is interesting to note that HMO penetration was not associated with the likelihood of having a dedicated Alzheimer's unit but that having a low Medicare census increased the likelihood of having an Alzheimer's unit. At the same time, facilities with a higher private pay census had a lower likelihood of having a dedicated subacute care unit. These relationships support the contention that the two types of units respond to the needs of different resource

constituencies. Contrary to expectation, a higher proportion of Medicare hospital discharges at the market level is associated with a lower likelihood that subacute care will be provided in dedicated units. Measurement at the market level may be too aggregated to detect the influence of referral patterns between individual hospital and nursing facilities. Alternatively, greater demand for postdischarge alternatives may increase the acuity for the facility overall instead of encouraging the development of dedicated units.

Competition among nursing facilities, for the most part, is an incentive for individual homes to innovate. In more concentrated, less competitive markets, facilities are less likely to provide specialty care, as indicated by the negative parameter estimate for the effect of the Herfindahl index in both models. In areas with more excess capacity, signifying greater competition, nursing facilities are more likely to provide specialty care of both types. However, the results show no effect of the availability of hospital-based nursing home substitutes, either inpatient or outpatient, on the likelihood that a facility will provide specialty care of either type. These hospital-based services, like outpatient day care and inpatient geriatric services, may be too focused on patients' short-term, rehabilitative needs to compete with services provided by nursing care facilities.

The degree of regulatory stringency in a state appears to constrain the development of Alzheimer's care units, but is not related to the development of subacute units in nursing facilities. The presence of either an operational CON program or a construction moratorium and more stringent payment methodologies–including prospective class payments and the absence of a case-mix adjustment system–are all associated with a lower likelihood that Alzheimer's care will be provided in dedicated units of individual facilities, but are unrelated to subacute care. However, as indicated by the sign of the coefficient for the interaction term, the likelihood of providing subacute care in a dedicated unit decreases as Medicaid census increases under prospective class payment. The results show no effect of a state's Medicaid reimbursement rate on the likelihood that nursing homes develop specialty care.

Finally, the results indicate that organizational characteristics are important enabling factors influencing the propensity to provide specialty care. Size and system membership, suggesting greater access to resources and greater flexibility in the allocation of resources, are associated with a greater likelihood that specialty care will be provided. For-profit status, on the other hand, is associated with a lower likelihood of providing specialty care. This suggests that differences in mission and motivation influence the decision to provide specialty care.

DISCUSSION

The cost, access, and quality implications of innovation in nursing facilities should be of great concern to policymakers. However, with the exception of one survey of health promotion activities in nursing homes (Brannon, Taylor-Nicholson, and Mahoney 1992), no research has addressed how or why facilities make decisions on introducing new technologies. This is in stark contrast to the extensive research on innovation and technology assessment in hospitals (Agency for Health Care Policy and Research 1992). The research described here provides a theoretical framework for exploring innovation in nursing facilities and preliminary cross-sectional evidence for its utility.

The results provide strong support for the resource dependency theory; in fact, the differences found in the factors important for the development of subacute and dementia units makes sense from the resource dependency perspective. A greater number of acute care providers, such as hospitals and HMOs, increased the development of subacute units but not dementia units. On the other hand, dementia units were more common in facilities with lower Medicare populations. Competition increased the likelihood that either type of unit was developed whereas, overall, more stringent state regulations decreased the likelihood that dementia units were developed but did not affect the development of subacute units. Finally, organizational factors played an important role in the development of any type of specialty care unit, with larger, chain-owned homes being more likely to provide these innovations.

This study raises several questions about what motivates facilities to innovate. For example, even though competition appears to be an incentive for providing specialty care, for-profits, presumably the most market-oriented providers, are less likely than non-profits to develop specialty care in highly competitive markets. For-profits may be less likely to develop specialty care because they lack access to the unrestricted revenues necessary for start-up of these units; subsidized non-profits and system-owned for-profits may have greater access to "deep pockets." Experience from the hospital sector suggests that while the provision of subacute care may meet other organizational objectives, the units are unlikely to be net profit contributors (Burns 1994). This may explain why small, independent for-profits tend not to participate in this market.

Greater HMO market penetration is associated with a higher likelihood that facilities provide subacute care, indicating that managed care is influencing the evolution of the nursing care industry as it has influenced the hospital industry. However, given the limited involvement of HMOs in long-term

care, they are probably having a less direct effect on nursing facilities than on hospitals. Hospitals forced to control costs in order to successfully negotiate managed care contracts may in turn be pressuring nursing facilities to provide post-discharge service options. In areas with more hospitals, competition is likely to be greater. This may account for the finding that facilities in areas with more hospitals relative to nursing facilities are more likely to provide specialty care.

This research also shows that regulatory controls directed at cost containment have hampered the development of Alzheimer's care units. However, whether regulation should be relaxed to encourage the development of these services requires careful analysis. There has been no rigorous assessment of whether the distribution of special care beds reflects underlying population needs. Furthermore, while there is some indication of improved outcomes in special Alzheimer's or dementia care units (Greene 1986), effectiveness compared to other treatment alternatives has not been established (Ohta and Ohta 1988). The National Institute on Aging is currently funding 11 projects designed to investigate the relative effectiveness of Alzheimer's unit alternatives (Alzheimer's Association 1992). It is hoped that the results of this research will provide much needed guidance in evaluating the most prevalent form of special care.

Finally, the results of this study suggest how specialty care units will change in terms of care technology and management requirements as this relatively recent innovation in nursing facilities becomes more established. Alzheimer's care is one of the earliest forms of special care units and, as these data indicate, it remains among the most common. Of all forms of special care, Alzheimer's care is the closest to the "core technology" of the nursing care facility. By contrast, the many other forms of specialty care that emerged later in response to market forces require technological changes in equipment and skills not commonly associated with nursing facility care. Because they represent a greater departure from the core technology, it is not surprising that they are less common than Alzheimer's care, although they may be poised for accelerated growth.

As nursing care facilities gain experience in care technologies and structural forces increase the demand for a broader array of post-hospital discharge alternatives, differentiation of special care units may occur. In fact, the finding that a high Medicare census reduces the likelihood of specialty care provision reflects a strategic choice between developing the more common Alzheimer's units and highly skilled subacute specialty care. Facilities providing skilled or

subacute care may not be able to provide simultaneously the custodial care required by Alzheimer's patients.

Future research should address the issue of strategic choice. The basic premise of a focus strategy is that the organization is able to serve a narrow strategic target more effectively and efficiently than more broadly based competitors (Porter 1980). Will nursing facilities focus on a particular type of specialty care to serve a narrow market segment more effectively, or will they compete broadly by offering a number of different types of specialty care? The results of this study suggest that a higher Medicare census encourages nursing facilities to compete through broad-based differentiation rather than a focus strategy. Market determinants of strategic choice are additional areas for research. While hospital-based substitutes do not appear to affect the provision of specialty care, home health care may pose more of a competitive threat, particularly for subacute care.

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